

GLINKOV, M.A.. doktor tekhnicheskikh nauk, professor.

Principles of fluid mechanics in baths and the heat-working of  
open-hearth furnaces. Stal' 16 no.4:356-358 Ap '56.(MLRA 9:7)  
(Open-hearth furnaces)

GLINKOV, M.A. professor, doktor tekhnicheskikh nauk; MEN'SHIKOV, R.I.,  
kandidat tekhnicheskikh nauk.

Investigating heat exchanges in open-hearth furnace combustion  
chambers. Sbor. Inst. steli no.35:146-157 '56. (MLRA 10:8)

1. Kafedra metallurgicheskikh pechey,  
(Open-hearth furnaces) (Heat--Transmission)

1977-1987-1-1-1-1

Translation from: Referativnyy zhurnal. Mekh. Tverdogo Tela. No. 1, p. 70 (USSR)

AUTHORS: Glinko, M. A., Kravandin, V. A.

TITLE: The Pressure Distribution in High-temperature Ceramic Recuperators (Raspredeleniye daвлений vysokotemperaturnykh keramicheskikh rekuperatorakh)

PERIODICAL: Vopr. Priklad. Mekh. Moscow: Mashinostroyeniye, 1956, pp 158-165

ABSTRACT: A report on experiments on the determination of the pressure drops of the air and of the flues in ceramic recuperators (R) in which the flue gases proceed downward through vertical pipes and the air moves in a loop-shaped path from the bottom toward the top passing horizontally between the staggered flue-gas pipes. In order to determine the pressure drops of the air and the flue gases at any point in the R, it is necessary to know their entrance pressures and the pressure at the given point of the R. The pressure change of the flue gases is readily computed since the frictional resistance and the geometric head are known. The computation of the resistance to the movement of air is more complicated. It is composed of the resistance of a group of flue-gas pipes and of the  $10^{-2}$  mm at

Card 1/2

117 1987 11 23 31

The Pressure Distribution in High-temperature Ceramic (cont.)

the end of each group. The resistance of such turns, which depends on the velocity of air and on the number of the rows of open orifices, was determined by means of an aerodynamic model of the R. At  $Re > 4700$ , the resistance of the turns remains constant. When the number of rows of open orifices is increased from 1 to 4, the resistance is considerably reduced; however, any further increase in the number of rows of open orifices has almost no effect and the resistance remains practically constant.

M. R.

1. Ceramic recuperator pressure distribution

Card 2/2

GLINKOV, M.A., professor, doktor tekhnicheskikh nauk; VAVILOV, N.S., kandidat tekhnicheskikh nauk.

Heat exchange in metallurgical furnace combustion chambers. Sbor.  
Inst. stati no.35:166-185 '56. (MLRA 10:8)

1. Kafedra metallurgicheskikh pechey.  
(Metallurgical furnaces) (Heat--Transmission)

GLINKOV, M.A., professor, doktor tekhnicheskikh nauk; KRIVANDIN, V.A.,  
kandidat tekhnicheskikh nauk.

Characteristics of heat exchange at the stack side of a tubular  
ceramic recuperator. Sbor. Inst. stali no.35:186-200 '56.

(MIRA 10:8)

1. Kafedra metallurgicheskikh pechey.

(Heat regenerators) (Heat--Transmission)

1957 12-23138

Translation from: Referativnyy zhurnal Metallurgiya, 1957, No. 12, p. 40 (USSR)

AUTHORS: Glinkov, M. A. Morkov, B. I.

TITLE: The Fusion of a Layer of a Metallic Charge Heated From Above  
(Plavlenie sloya metallicheskoy shikhty nagrevayemogo sverkh)

PERIODICAL: V. b. Prib. i Prikl. Metallovedeniye, Moscow, Metallurgizdat, 1956, pp. 12-238

ABSTRACT: To conduct laboratory studies of the process of fusion (F) of a metallic charge (Ch), an experimental installation was designed which consisted of two adjoining chambers: an upper chamber containing the heating unit and a lower chamber containing the basin with the fusible charge. In order to reduce heat losses the internal surfaces of the chambers were coated with Ag and equipped with a system of evaporation cooling. Phosphorus was selected as the charge material because it may be utilized in charges of all shapes and dimensions. The charge was placed into a steel shell fitting snugly into a steel cylinder equipped with a meth cover intended to prevent the charge from rising above the top of the cylinder. The upward movement of the shell was accomplished by means of a special rod actuated through weight.

Card 1/2

157 1957-12 23138

# The Fusion of a Layer of a Metal Charge Heated From Above

The advance of the rod is a measure of the settling of the charge. To prevent the oxidation of the Pb the basin is filled with N<sub>2</sub>. For all fusion processes readings are taken on the variation of the height of the charge layer with time, the amount of heat imparted to the charge, and the temperatures at various points of the layer. A series of fusions, identical in all respects, was performed with interruptions in order to observe the condition of the charge at various stages. A study of the charge cooled at different stages of the fusion process showed that the melt did not flow to the bottom but that it advanced downward along a single front, enveloping the solid lump and giving up its heat to them. In rapid fusion the melt filled all spaces between the lumps, thereby preventing the liquid melt from transferring heat to the lower layers of the charge. From an analysis of the experimental melts the fusion process may be divided into three types: the heating of the surface of the charge to the melting point, the fusion preceding the complete settling of the layer, and the fusion after the complete settling of the layer and after the formation of a free liquid surface.

Card 2/2

M. R.

1. Sublump-HEK 2. Furnace-Heating 3. Sample charge-- Applications



137-58-6-11676

Translation from Referativnyi zhurnal. Metallurgiya, 1956, Nr 6, p 95 (USSR)

AUTHORS Glukov, M.A., Men'shikov, R.L., Morozov, V.A., Shorn, A.F.

TITLE Thermal Operation of an Open-hearth Furnace When Oxygen is Used to Intensify the Combustion Process (Teplovaya rabota martenovskoy pechi pri primeneni kisloroda dlya intensifikatsii protsessa goreniya)

PERIODICAL V sb. Primeneniye kisloroda v metallurgii. Moscow. Metallurgizdat, 1957, pp 95-114

ABSTRACT Results are presented of an investigation on the introduction of O into the flame jet through a tuyere from the sides of the duct into a 200-t furnace at the "Zaporozhstal'" Works. When the oxygen enrichment of the air is 25% and the maximum heat input is 33.2 mill. kcal/hr. output rose by 32.2% and the nominal consumption of fuel dropped by 16.8%. With 30% enrichment and a maximum heat input of 33.4 mill. kcal/hr. the figures were, respectively, 61.0 and 35.0% of those of non-oxygen heats. Ratios for output and unit fuel consumption to average thermal stress and degree of enrichment of the air by O<sub>2</sub> are given. The following factors are examined: the conditions of

Card 1.2

137-58-6-11678

Thermal Operation of an (cont.)

temperature in the course of a heat, the distribution of heat flow across the area of the bath, and the change in the composition of combustion products in the working space. Heat balances are compiled as an average for a heat for various thermal and oxygen regimes.

G.G.

1. Oper. heat. (cont.) (cont.) Oxygen Applications

Card 2/2

SOV-157-58-8-16508

Translation from Referativnyi zhurnal Metallurgiya, 1957, No. 8, p. 39 (USSR).

AUTHORS Glinkov, M.A.; Demin, G.I.

TITLE Recirculating-heat Steel Smelting Furnaces (Retsirkulyatsionnye staleplavil'nye pechi)

PERIODICAL V sb. Primeneniye kisloroda v metallurgii, Moscow, Metallurgizdat, 1957, pp. 186-216.

ABSTRACT Recirculating-heat furnaces (RF) are classified as a third type of steel smelting furnaces characterized by bilateral heating of the hearth (H); unlike open-hearth furnaces, the process of heating is continuous (the supply of heat to the H is uninterrupted) which makes it possible to utilize the principle of heat recovery (analogous to the method employed in direct-current furnaces) rather than regeneration, as is typical of open-hearth furnaces. The RF may operate with hot or cold blowing. They may operate on nonenriched air alone, provided the latter has been heated to a high temperature, because complete combustion of fuel in the H of an RF requires considerably smaller amounts of excess air than in the case of direct-current or open-hearth furnaces (1.1 instead of 1.6); consequently, the

Card 1/3

SOV/137-58-8-16308

*Recirculating-heat Steel Smelting Furnaces*

temperature effect of air which had been preheated to a temperature of  $800^{\circ}\text{C}$  in an RF is equivalent to the effect of air preheated to  $1100^{\circ}$  in an open-hearth furnace. The authors present data of an investigation of a 10-ton fuel-oil operated RF which had been placed into operation in 1952 at the Novo-Tul'skiy metallurgical plant and which operated without heated-air blowing until 1955, at which point it was equipped with tubular (fireclay tubes) recuperators. Prior to 1955, the RF operated on air enriched with 70-80% of  $\text{O}_2$  at a pressure of approximately 2 at. Hot air from the recuperators equipped with end-mounted tuyeres with nozzles, passes into the IF through short uptakes which are inclined at a  $16^{\circ}$  angle. Since the volume of the checkered brick work of the recuperator constitutes 70% of the required volume, it was found possible to heat the air in amounts only up to 3000-3500  $\text{nm}^3/\text{hr}$ . Expressed in millions of kcal/hr, the thermal loading of the furnace constitutes 8.5-9.0 during the charging-fusion period, and 1.0-4.5 during the finishing stages. As a result of the investigation it was found that the RF's are capable of smelting soft iron (of the Armino type) steels Nrs 2 and 3, carbon steels Nrs 30, 40, 45, and with particular ease, low-carbon types of steel, because the mean rate of combustion of C amounts to 2-4%/hr. The smelting time varied between 1.98 and 2.82 hrs. the consumption of conventional fuel fluctuated from 965 during smelting on completely liquefied

Card 2 3

MAY 1978 S. J. DODS

*Polymer Letters*, Vol. 6, No. 10, pp. 97-100, 1968  
© 1968 John Wiley & Sons, Inc.

[illegible]

22

Curci,

SOV/137-58-7-14369

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, N<sup>o</sup> 7, p 60 (USSR)

AUTHORS: Glinkov, M.A., Ivanov, N.I.

TITLE "A Recirculation Method of Oxygen Use in Large Open Hearths  
(Retsirkulyatsionnyy metod primeneniya kisloroda v bol'shegruznykh martenovskikh pechakh)

PERIODICAL: V sb. Primeneniye kisloroda v metallurgii. Moscow, Metallurgizdat, 1957 pp 255-284

ABSTRACT An investigation is made of the operation of a 135-t open-hearth furnace (OH) with O<sub>2</sub> employed by a recirculation method (RM) consisting of supplementary heating of the OH at various periods during the heat by fuel burnt in a blast highly enriched by O<sub>2</sub> (as much as 80-100%, the fuel and the blow being delivered to the melting chamber of the OH through both checker ports simultaneously. All other conditions being equal, heating from both sides makes it possible to increase the total heat intake of the bath by 19-20% while a high level of enrichment of the blast by oxygen makes for a sharp reduction in thermal load on the outgoing side of the furnace. Thus, when the blow is enriched 40%, and the thermal load at the valve is

Card 1/3

SOV/137-58-7-14369

#### A Recirculation Method of Oxygen Use in Large Open Hearths

$35 \cdot 10^6$  kcal/hr.  $15 \cdot 10^6$  kcal/hr are emitted from the melting chamber, but with 80%  $O_2$  this figure is  $9 \cdot 10^6$  kcal/hr, and with pure  $O_2$  it is only  $7 \cdot 10^6$  kcal/hr, i.e., almost as much as is rejected to the stack when the furnace is operated by standard open-hearth practice (SOP). The use of high-calorie fuel makes it possible in turn to reduce the quantity of combustion products per 1000 kcal of heat input to the furnace. Investigation has established that at identical thermal load on the valve, the use of RM only during the melting period provides an increase in OH output rate of 10-15 t/hr, i.e., 30-50% higher than the rate of output of this same furnace when worked by (SOP). The rate of melting of the charge in this case exceeds that by the SOP by 45-50%. When the RM is used during the charging, heating, and melting periods, the smelting rate may attain 96.2 t/hr, while the length of the heat is cut to 3.5 hours instead of 5 hours when the furnace is operated with the RM during the melting period only. The unit consumption of conventional fuel is reduced from 129 to 95.11 kg/t when the RM is used during the melting period only, and to 81.6 kg/t when the RM is used during the periods of charging, heating, and melting. The consumption of  $O_2$  per ton of steel under these conditions rises from 50.0 to 66.81 and 129.1  $m^3$ , respectively. When the furnace is operated by the RM, no need exists to change the charge in the direction of greater or smaller amounts of ore than is used in SOP.

Card 2/3

SOV 137-55-7-14369

# A Recirculation Method of Oxygen Use in Large Open Hearths

The mean rates of carbon burn-off during the melting period were (in % per hour) 1.2-2.2, while the maximum was 3-3.4 and the rate during the working period was 0.83-1.04. An Fe balance compiled for all the experimental heats shows that operation of the furnace by the RM during the melting period only leads to a loss of 0.3-3% Fe by burning while use of the RM during the charging, heating, and melting periods increases this loss to 1.8-4.8%. An increase in the liquid-pig-iron contents of the charge from 60-70% to 90-100% does not affect the hourly output rate of the OH, the unit consumption of fuel and of O<sub>2</sub> as reported above, but makes it possible to attain an Fe pick-up of 3.7-6.1%. The temperature of the combustion products in the uptakes is no higher than with the SOP, the temperature of the uptake walls being 1680-1700°C. The temperature of the gas checkers dropped during the period of use of the RM (as combustion products were not passed through them), and the temperature of the air checkers fluctuated from 1260 to 1350°. The temperature of the roof and the air checkers is easily regulated by changing the fuel and O<sub>2</sub> flow.

1. Open hearth, furnace--Performance characteristics of open hearth N.I.

Card 3/3



GLINKOV, M.

DANIKHELKA, A., doktor, inzh.; MIKHAYLOV, O.A., kand. tekhn. nauk;  
GONCHARENKO, N.F.; KLIMASENKO, L.S.; OYKS, G.K., prof., doktor  
tekhn. nauk; SEMENENKO, P.P.; MORCZOV, A.N., prof., doktor tekhn.  
nauk; GLINKOV, M.A., prof., doktor tekhn. nauk; KAZANTSSEV, I.G.,  
prof., doktor tekhn. nauk; KOCHO, V.S., prof., doktor tekhn. nauk;  
ENKESH, Sh., kand. tekhn. nauk; MOROZENSKIY, L.I., kand. tekhn.  
nauk; GURSKIY, G.V.; SPHRANSKIY, V.G.; NOVIK, L.M., kand. tekhn.  
nauk, starshiy nauchnyy sotrudnik; SHNEYEROV, Ye.A., kand. tekhn.  
nauk; PAPUSH, A.G., kand. tekhn. nauk; MAZOV, V.F.; SAMARIN, A.M.

Discussions. Biul. TSNIICM No. 23/29:27-35 '57. (MIRA 11:4)

1. Glavnyy staleplavil'shchik Ministerstva metallurgicheskoy pro-  
myshlennosti i rudnikov Chekhoslovatskoy respubliky (for  
Danikhelka). 2. Direktor Tsentral'nogo instituta informatsii chernoy  
metallurgii (for Mikhaylov). 3. Direktor Ukrainskogo instituta  
metallov (for Goncharenko). 4. Glavnyy staleplavil'shchik  
Kuznetskogo metallurgicheskogo kombinata (for Klimasenko). 5. Zave-  
duyushchiy kafedroy metallurgii stali Moskovskogo instituta stali  
(for Oyks). 6. Zamestitel' glavnogo inzhenera zavoda im. Serova  
(for Semenenko). 7. Zaveduyushchiy kafedroy metallurgii stali  
Chelyabinskogo politekhnicheskogo instituta (for Morczov). 8. Zave-  
duyushchiy kafedroy metallurgicheskikh pechey Moskovskogo instituta  
stali (for Glinkov). 9. Zaveduyushchiy kafedroy metallurgii stali  
Zhdanovskogo metallurgicheskogo instituta (for Kazantssev). 10. Zave-  
duyushchiy kafedroy metallurgii stali Kiyevskogo politekhnicheskogo  
instituta (for Koko).  
(Continued on next card)

DANIKHELKA, A.---(continued) Card 2.

11. Nachal'nik tekhnicheskogo otdela Ministerstva chernoy metallurgii Vengerskoy Narodnoy Respubliki (for Kookash). 12. Zamestitel' direktora Novotul'skogo metallurgicheskogo zavoda (for Gurskiy). 13. Nachal'nik tekhnicheskogo otdela zavoda "Dneprospetsstal' (for Speranskiy). 14. Institut metallurgii im. Baykova AN SSSR (for Novik). 15. Nachal'nik staleplavil'noy laboratorii Ukrainskogo instituta metallurgii (for Suneyev). 16. Nachal'nik laboratorii po nepreryvnoy razlivke stali Zhdanovskogo filiala Tsentral'nogo nauchno-issledovatel'skogo instituta Ministerstva stroitel'noy promyshlennosti (for Papush). 17. Nachal'nik martenovskogo tsokha zavoda "Zaporozhstal'" (for Marov). 18. Zamestitel' direktora Instituta metallurgii im. Baykova AN SSSR, chlen-korrespondent AN SSSR (for Samarin).  
(Steel-Metallurgy)

137-58-6-11701

Translation from Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 70 (USSR)

AUTHORS Glinkov, M.A., Mitkalimyy, V.I.

TITLE: The Thermal Performance of an Open-hearth Furnace Operating by the Scrap Process (Teplovaya rabota martenovskoy pechi pri skrap-protsesse)

PERIODICAL. Sb. Mosk. in-t stali, 1957, Vol 37, pp 22-32

ABSTRACT A description of the results of 300 experimental heats in a 70-t furnace at the "Hammer and Sickle" Works, with delivery of O<sub>2</sub> into the heavy-oil jet flame, are described. O<sub>2</sub> enrichment of the blow was 25-35%. Changes occurring in the temperature of the roof and flame in the course of a heat, at various rates of O<sub>2</sub> flow, are examined. The temperature of the roof during the charging period varied in accordance with the duration thereof from 1400 to 1650°C, attaining a minimum at the end of the charging period. During the melt-down and working period, the temperature of silica-brick roofs attained 1650°, while basic roofs reached 1780°. The temperature of the flame, measured by an optical pyrometer, was 1800° during the charging period and 1850° at the end of the melt-down in heats without

Card 1 of 2

137-58-6-11703

The Thermal Performance (cont.)

O<sub>2</sub>, but with a 25% enrichment of the blow, the flame temperature rose to 1930° during charging, while 32% enrichment brought it to 1990°.

G.G.

1. Open burner flame--flame (total) properties--...  
results

Card 2/2

117-58-e-11676

translation from Russian by the author, N. S. Vasilov, No. 6, p. 65 (USSR)

AUTHORS Gilekoy, M. A. Vasilov, N. S.

TITLE Heat Exchange in the Space Above the Path of a Recirculation-type Steel-foundry Furnace (teplobimernoye postranstvo nad van-nov retsirkulyatsionnoy staleplavil'noy pechny)

PERIODICAL Sb. Mosk. in-t stali, 1957, Vol. 37, pp. 305-326

ABSTRACT A presentation of the results of an investigation of heat exchange in a 10-ton steel-foundry recirculation-type furnace (RF) having 9.6 m<sup>2</sup> hearth area and simultaneous two-sided heavy-oil feed at 2-3 atm excess pressure, sprayed by compressed air at 4-5 atm excess pressure. The heat flux, measured by a heat gage of special design rises gradually during the heat and then drops at the end of the working period. The heat flow over the bath,  $Q_B$ , varies across the width of the furnace from one melt to the next, from between 800-1,100 thousand kcal/m<sup>2</sup>hr at the front wall to 1200-1450 rearwards of the middle of the furnace, and drops to 1050-1150 thousand kcal/m<sup>2</sup>hr at the rear wall. The take up of heat by the bath,  $\Delta Q$ , varies in similar fashion, attaining levels of 1000-1100 thousand kcal/m<sup>2</sup>hr.  $Q_B$  varies insignificantly along the length of the

Card 1-2

157-58-6-11676

# Heat Exchange in the Space (cont.)

furnace, and  $\Delta Q$  attains a maximum in the center of the furnace. The heat flux is distributed across the area of the furnace considerably more uniformly than in an open hearth, since the two-sided fuel feed makes it possible to maintain identical thermal conditions in either half of the working space.  $Q$  varies during a melt as follows through the height of the working space from 1100-1250 thousand kcal/m<sup>2</sup>hr at a point 300 mm from the surface of the bath to 850-900 at a height of 1200-1300 mm. Curves are presented for the variation of calculated temperature and in black-body radiation of the gas at different heights. The heat emissivity by radiation is 1500-2000 kcal/m<sup>2</sup>°C hr, while for an open hearth furnace it does not exceed 1000. The bath surface is 30-50% black and the temperature of the RF bath surface is 1700-1800°C. The temperature of the metal is the same as in an open-hearth furnace. In the RF the slag undergoes considerably greater overheating. In the RF there is virtually no stirring during the heat when the bath is not undergoing vigorous agitation. The directed heat exchange plays a significant role

G G

1. The heat exchange in the space of the furnace is calculated by the method of the balance of heat flows.  
2. The heat exchange in the space of the furnace is calculated by the method of the balance of heat flows.

Card 2 2

LEONIDOV, N K

2(5) PLANS I BOOKS INFORMATION 80V/1897

Abstracts book USSR. Dashed linebook i tehnicheskoy infirmatell

Metallurgiya USSR, 197-1997, t. 1. (Metallurgy of the USSR, 197-1997, Vol. 1)  
Moscow, Metallurgizdat, 1998. 745 p. 5,000 copies printed.

Ed. (Title page): I. P. Bardin, Academician; Ed. (Inside book): G. V. Popova;  
Tech. Ed.: O. G. Bekker.

PURPOSE: The book is intended for scientific workers and engineers in metallurgical plants and in the machine-building industry. It may also be used by students in advanced courses in metallurgical vases.

COVERAGE: This collection of articles covers extensively practical and theoretical developments in Soviet metallurgy during the last 50 years. The material deals with the discovery and development of the major ore deposits and the growth of the metal industry in various parts of European and Asiatic USSR. Research institutions, laboratories, their location, and the names of the scientists and engineers involved are listed. Many papers cover the development of the metal industry in the USSR, but the book is not intended to be a comprehensive coverage of each article to list them. The authors claim that the processes, methods and theories described in this book reflect the most recent developments in Soviet metallurgy.

Card 1/41

# Metallurgy of the USSR (Cont.)

80V/1897

270

Olislov, M.A., Development of Furnace Theory in the USSR  
The author traces the development of scientific design of furnaces in the Soviet steel industry. The application of physical and chemical principles is presented in chronological order. The theoretical aspects of furnace operation and the processes are discussed with illustrations. There are 54 references, 50 Soviet, 1 French, and 1 English.

Arkus'ev, S.D., Production of Converter Steel in the USSR

283

An outline is given of the development of converter steel production in the USSR. It is stated that present developments in the steel industry are based on the achievements of the past. The author states that it is suitable for better processes, especially the Thomas process, in the converter area and the phosphoric acid process. The use found in Kazakhstan are treated by the Thomas process. Working with oxygen is said to have opened new possibilities for the converter process in the USSR. There are 25 Soviet references.

Mineral, I.P., Production of Electric Steel in the USSR

294

The author traces the development of electric steel production from the early twenties to the fifth five year plan. Production of steel is

Card 8/21

SOVET-57-1-1-1

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 1, p 5 (USSR)

AUTHORS: Glinkov, M. A., Krivandin, V. A., Bugrova, B. A.

TITLE: Directed Flame Radiation With Uneven Temperature Distribution  
(Napravlenaya radiatsiya plameni pri neravnomernom raspredelenii temperatur)

PERIODICAL: Nauchn. dokl. vyssh. shkoly. Metallurgiya, 1958, Nr 1, pp 59-61

ABSTRACT: The investigation was carried out on a stand consisting of a shielded combustion chamber with three burners (of the concentric-tube type) forming three parallel, vertical flame jets set so close together that they may be considered as layers of a single flame sheet. The temperature of each layer of the flame was measured by a bare Pt - Pt/Rh thermocouple and the total radiation along the length of the flame was measured by a diaphragmed differential thermopile (Cu-constantan). City gas with a heat value of 300-660 kcal/m<sup>3</sup> was burned. Data are adduced on the effect of the distribution of temperatures, thermal load, excess-air coefficient, enrichment of air with O<sub>2</sub>, and carburization with pulverized coal throughout the thickness of the flame on its radiation. Changes in the layer closest to

Card 1.2



SOV/37-59-1-1

Directed Flame Radiation With Uneven Temperature Distribution

the measuring device have a predominant effect on the radiation of the flame jet.

G. G.

Card 2/2

SOV 157-59-1-329

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, No. 1, p. 11 (USSR)

AUTHORS: Glukov, M. A., Kostern, V. V.

TITLE: An Investigation of the Thermal Performance of a Recirculating Steel-smelting Furnace Designed by Prof. M. A. Glukov Employing Ceramic Recuperators (Issledovaniye teplovoy raboty retsirkulyatsionnoy staleplavil'noy pechi: sistemy prof. M. A. Glukova s keramicheskimi rekuperatorami)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, No. 1, pp 94-111

ABSTRACT: The 10-ton recirculating steel-smelting furnace (RSF) is equipped with two recuperators having a total area of 345 m<sup>2</sup>. The furnace is fired with fuel oil, the degree of enrichment of air with O<sub>2</sub> being varied from 45 to 21% in the course of a heat. Compared with corresponding factors in open-hearth furnaces operated without O<sub>2</sub>, the production efficiency of the RSF is greater. The consumption of O<sub>2</sub> amounted at times to 270 kg/ton. An increase in the degree of oxidation of the slags constituted the major technological difficulty of the process; however, by means of appropriate selection of an

Card 1/2

SOV.137-59-1-127

*An Investigation of the Thermal Performance of a Recirculating (cont.)*

optimal oxygen-air ratio, this condition could be reduced to 14-18%  $\Sigma Fe$ . The degree of oxidation of the metal was even lower in this process than in the case of standard open-hearth furnaces. A reduction in  $O_2$  consumption is not justified economically since the cost of  $O_2$  constitutes only a comparatively small fraction of the cost of a ton of steel. Owing to the insufficient length of the hearth, the advantages of two-sided heating of molten metal could not be fully evaluated, since the meeting of the flames in the center of the furnace produces a vigorous stream of gases resulting in the disintegration of the central portion of the crown of the furnace. The roof of the furnace could withstand a maximum of 175 smeltings. Because of the vigorous recirculation occurring within the hearth, the amount of smelting dust carried into the recuperators was considerably reduced (by 5-8 times), which greatly improved the operational performance of the latter.

M. M.

Card 2/2

AUTHOR: Shukov, I. A., Lomison, I. A. ID# 163-58-2-22/46  
 TITLE: Determining the Mean Flow Rate in Short Channels by Means of  
 Radioactive Indicators (izmereniye skorosti potoka v  
 kratkikh kanalakh s pomoshchyu radioaktivnykh indikatorov)  
 ORIGIN: Izvestiya vuzovskoy shkoly metalurgiya, 1959.  
 (in Russian)  
 ABSTRACT: A method for determining the mean flow rate in short  
 channels by means of radioactive indicators was worked out.  
 Ag<sup>110</sup> was used as  $\gamma$ -radioactive indicator and Ag<sup>110m</sup> as  
 water-soluble compound. An equal distribution of the radio-  
 active indicator introduced along the vertical direction of  
 the channel was achieved, and the distribution of the flow  
 of combustible products in the lower cross section of the  
 channel was determined. The flow rate of the combustible pro-  
 ducts in the vertical direction of the channel amounts to  
 1.2-2.0 m/sec with a probable error of 8-10%. The method  
 suggested makes possible the determination of the boundary  
 of the flow in the vertical direction of the channel.  
 There are 2 figures and 1 table.

Resolving the Flow of Information in the Soviet Union  
by [illegible] and [illegible]

Published by: [illegible] Institute for [illegible]

March 1987

3-58-3-4/32

AUTHOR: Glinkov, M.A., Professor, Doctor of Technical Sciences

TITLE: New Progressive Features in Teaching General Scientific Subjects (Novoye, progressivnoye - v prepodavaniiye otshchenauchnykh distsiplin) Must We Expand Only the General Scientific Cycle? (Nuzhno-li rasshiroyat' tol'ko otshchenauchnyy tsikl?)

PERIODICAL: Vestnik Vysshey Shkoly, 1988, Nr 3, pp. 21 - 24 (USSR)

ABSTRACT: The author disagrees with the following extreme view-points regarding higher school teaching methods: that special technological subjects should be reduced to a minimum while the general scientific and general engineering subjects should be increased; and that training in the student specialties should be increased. He explains how extremes can be reconciled and concludes that in order to improve teaching plans and programs there must be an increase in basic subjects and a transfer of the "theoretical fundamentals" (common to various specialties) from the special subject to the basic subject category. General scientific subjects should be increased only when badly needed, as in mathematics. The author admits that the better the students master formal mathematics, the easier they will comprehend engineering.

Card 1/2

3-55-3-4/52

New Progressive Features in Teaching General Scientific Subjects. Must We Expand Only the General Scientific Cycle?

However, if the basic subjects are not sufficiently developed the prevalence of general scientific subjects in the curriculum will not yield the desired results. He emphasizes the importance of increasing the level of training in the theoretical fundamentals of technology. There is one Soviet reference.

ASSOCIATION: Moskovskiy institut stali imeni I. V. Stalina (Moscow Institute of Steel imeni I. V. Stalin)

AVAILABLE: Library of Congress

Card 2/2

[illegible][illegible]

2011

[illegible][illegible]

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

Исследования в области металлургии, *Metallurgiya*, 1964, 10, 11, 1811-1812, 1813-1814, 1815-1816, 1817-1818, 1819-1820, 1821-1822, 1823-1824, 1825-1826, 1827-1828, 1829-1830, 1831-1832, 1833-1834, 1835-1836, 1837-1838, 1839-1840, 1841-1842, 1843-1844, 1845-1846, 1847-1848, 1849-1850, 1851-1852, 1853-1854, 1855-1856, 1857-1858, 1859-1860, 1861-1862, 1863-1864, 1865-1866, 1867-1868, 1869-1870, 1871-1872, 1873-1874, 1875-1876, 1877-1878, 1879-1880, 1881-1882, 1883-1884, 1885-1886, 1887-1888, 1889-1890, 1891-1892, 1893-1894, 1895-1896, 1897-1898, 1899-1900, 1901-1902, 1903-1904, 1905-1906, 1907-1908, 1909-1910, 1911-1912, 1913-1914, 1915-1916, 1917-1918, 1919-1920, 1921-1922, 1923-1924, 1925-1926, 1927-1928, 1929-1930, 1931-1932, 1933-1934, 1935-1936, 1937-1938, 1939-1940, 1941-1942, 1943-1944, 1945-1946, 1947-1948, 1949-1950, 1951-1952, 1953-1954, 1955-1956, 1957-1958, 1959-1960, 1961-1962, 1963-1964, 1965-1966, 1967-1968, 1969-1970, 1971-1972, 1973-1974, 1975-1976, 1977-1978, 1979-1980, 1981-1982, 1983-1984, 1985-1986, 1987-1988, 1989-1990, 1991-1992, 1993-1994, 1995-1996, 1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 2319-2320, 2321-2322, 2323-2324, 2325-2326, 2327-2328, 2329-2330, 2331-2332, 2333-2334, 2335-2336, 2337-2338, 2339-2340, 2341-2342, 2343-2344, 2345-2346, 2347-2348, 2349-2350, 2351-2352, 2353-2354, 2355-2356, 2357-2358, 2359-2360, 2361-2362, 2363-2364, 2365-2366, 2367-2368, 2369-2370, 2371-2372, 2373-2374, 2375-2376, 2377-2378, 2379-2380, 2381-2382, 2383-2384, 2385-2386, 2387-2388, 2389-2390, 2391-2392, 2393-2394, 2395-2396, 2397-2398, 2399-2400, 2401-2402, 2403-2404, 2405-2406, 2407-2408, 2409-2410, 2411-2412, 2413-2414, 2415-2416, 2417-2418, 2419-2420, 2421-2422, 2423-2424, 2425-2426, 2427-2428, 2429-2430, 2431-2432, 2433-2434, 2435-2436, 2437-2438, 2439-2440, 2441-2442, 2443-2444, 2445-2446, 2447-2448, 2449-2450, 2451-2452, 2453-2454, 2455-2456, 2457-2458, 2459-2460, 2461-2462, 2463-2464, 2465-2466, 2467-2468, 2469-2470, 2471-2472, 2473-2474, 2475-2476, 2477-2478, 2479-2480, 2481-2482, 2483-2484, 2485-2486, 2487-2488, 2489-2490, 2491-2492, 2493-2494, 2495-2496, 2497-2498, 2499-2500, 2501-2502, 2503-2504, 2505-2506, 2507-2508, 2509-2510, 2511-2512, 2513-2514, 2515-2516, 2517-2518, 2519-2520, 2521-2522, 2523-2524, 2525-2526, 2527-2528, 2529-2530, 2531-2532, 2533-2534, 2535-2536, 2537-2538, 2539-2540, 2541-2542, 2543-2544, 2545-2546, 2547-2548, 2

*Journal of Management Education* 30(6)

It was the results of the experiments for the case of a flow of air in the inlet in the form of a jet that are of interest in this paper. The flow of air was of a slight turbulence was considered. The shape of the surface of the inlet rail lines in the rail line system is shown in Fig. 1, a-d. The position of the inlet rail line in the inlet was determined. The angular coefficients  $\Psi_{in}$  at the flow of air into the inlet were defined by the flow of air into the inlet.

$$\psi_{\text{eff}} = \frac{\sum_{i=1}^n \psi_i \cdot \frac{\partial \psi_i}{\partial \psi_{\text{eff}}}}{\sum_{i=1}^n \frac{\partial \psi_i}{\partial \psi_{\text{eff}}}}, \text{ mit } \psi_{\text{eff}} = \psi_{\text{eff}}(\mathbf{x})$$

100

and that of  $\varphi_{\alpha_2} \in \mathcal{E}_\alpha$  for the other term of the





GLINKOV, M.A., doktor tekhn.nauk, prof.; TY. Shuk, V.M., kand.tekhn.nauk

New design of recuperative soaking pits. Izv. vys. ucheb. zav.;  
chern. met. no.7:67-89 J1 '54. (MIRA 11:10)  
(Furnaces, Heating)

GLINKOV, M.A., prof., doktor tekhn.nauk; PISKUNOV, A.A., inzh.

Modeling radiant heat exchanges in industrial furnaces by means of  
light. Izv.vys.ucheb.zav.; Chernomet. no.11:65-76 '58.

(MIRA 12:1)

1. Moskovskiy institut stali. Rekomendovano kafedroy metallurgiche-  
skikh pechey.

(Metallurgical furnaces) (Heat--Transmission)

(Engineering models)

GLINKOV, Mark Alekseyevich; SUSHKIN, I.N., red.; VAYNSHTEYN, Ye.B.,  
tekhn.red.

[Principles of the general theory of the thermal operation of  
furnaces] Osnovy obshchei teorii teplovoi raboty pechei.

Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po cherno i tsvetnoi  
metallurgii, 1959. 416 p.

(MIRA 13:1)

(Thermodynamics)

(Furnaces)

AUTHORS: ~~Glinkov, M.A.~~, Doctor of Technical Sciences and  
Demin, G.I., Candidate of Technical Sciences

SOV/133-59-1-2/23

TITLE: 'Recirculation-type Recuperative Steelmaking Furnace  
(Retsirkulyatsionnaya rekuperativnaya staleplavil'naya  
pech')

PERIODICAL: Stal', 1959, Nr 1, pp 24 - 31 (USSR)

ABSTRACT: The design and operation of a recirculation-type recuperative steelmaking furnace of 10 tons capacity is described. A recirculation furnace differs from an open-hearth furnace in that it operates with both burners simultaneously. Impact of two streams of gases in the centre of the furnace causes their intensive recirculation which sharply decreases the amount of dust in the waste gas. The design and dimensions of the furnace are shown in Figures 1, 2 and 3. In appearance the furnace is similar to an open-hearth furnace of the same capacity. Fuel oil is simultaneously supplied to both burners and the gaseous combustion products pass from the working volume through both parts along vertical flues into slag pockets and then to recuperators, waste gas flues and the chimney. Each recuperator was of  $34.5 \text{ m}^3$  in volume and

Card1/4

3 7/137-59-1-2/23

Recirculation-type Recuperative Steelmaking Furnace

240 m<sup>2</sup> in heating surface area. The stream of burning hot oil is used as an injector for air from the recuperator which decreases air losses. Proportioning of the supply of oil, oxygen and air is done separately for each flame. Recuperators are protected from overheating by an automatic supply of air to the overtube space in order to decrease the waste-gas temperature. Unfortunately, the recuperators were made of an insufficient volume (70% of the necessary) and their cleaning during operation was impossible due to insufficient cross-section of flues between recuperators and slag pockets. For a normal prolonged operation of recuperators only 1-2 rows of tubes from a high refractory material are necessary, the remaining tubes could be made from chamotte. Operation of the recuperator will be described in a separate paper. The durability of recuperator, first campaign - 1 480 heats, second 1 082. Air and recuperator's temperature are shown in Figure 4. Smelting of MSt3 killed steel in the furnace is described in some detail. Average technological indices of the heats are shown in the table; the dependence of the consumption of fuel and oxygen during charging and melting and of the duration of this period on the duration of

Card2/4

S.V/133-59-1-6/23

Recirculation-type Recuperative Steelmaking Furnace

charging is shown in Figure 5 and main characteristics of a heat in Figure 6. It is claimed that for the first time in steelmaking practice, the possibility of operation under industrial conditions of a recuperative furnace with ceramic recuperators capable of pre-heating air to 1 000 °C was demonstrated. The proving series of heats (68 heats) under conditions near to the normal operating conditions had the following mean operating indices (MSt.3 steel for a continuous casting machine): duration of one heat 2 hours 43 minutes, consumption of oil 178 kg/ton, consumption of oxygen 170 m<sup>3</sup>/ton of liquid steel; the yield of liquid steel 91-93%. The furnace is suitable for the production of killed steel MSt.3 (for a continuous casting machine) in quality equal to that produced in a basic open-hearth furnace. As the velocity of decarburization can be varied within a wide range (from 2.0 to 0.36% hr), the furnace is particularly suitable for smelting low-carbon and specially soft steels (the sum of admixtures C + Mn + S + P < 0.075%). High productivity of the recirculation furnace led to a considerable economy in respect of the constant expenses and the cost of oxygen is more than covered by fuel economy. The overall cost of

Card3/4

Recirculation-type Recuperative Steelmaking Furnace SCN/135-87-1-6/23

steel does not exceed that in the normal open-hearth furnaces. Under operating conditions of the experimental furnace it was difficult to establish the economic efficiency of recirculating recuperative furnaces. It would be advantageous to build a 50-100 ton furnace capable of operating with oil and a gas of a high calorific value. There are 6 figures, 1 table and 4 references, 1 of which is German and 3 Soviet.

ASSOCIATION: Moskovskiy institut stali (Moscow Institute of Steel)

Card 4/4



18(3)

AUTHORS:

Glinkov, M. A., Serokhvostov, A. I.

TITLE:

A Model Investigation of the Processes of Settling and Carrying-out of Dust in Steel-melting Furnaces (Issledovanie na stende protsessov osedaniya i vyvoda pyli v staleplavil'nykh pechakh)

PERIODICAL:

Nauchnyye izklady vysshey shkoly. Metallurgiya, 1957, Nr 2, pp 84-89 (USSR)

ABSTRACT:

The model of a steel-melting furnace was made of plexiglass on a scale of 1 : 15 (Fig. 1). The air supply working as a model of the gas circulation could be blown in, as in the original, as a direct current with unilateral and double return flow. To imitate the coarse-grained dust, water was introduced into the tank of the model, and air was blown in by a series of tubes under the water surface. The drops carried away were collected in 10 measuring points (Fig. 2) by means of rolls of filter paper. For the finer dust fraction the metal level of the tank was regulated by a metal coil with 20 openings by which compressed air was blown and then was absorbed in the vacuum of a glass cartridge of powdered sulfur. The results of the model studies under

Cont 1/2

A Model Investigation of the Behaviour of Soluble and Insoluble Dust in Steel-Melting Furnaces

Different conditions of circulation. In the case of burning with a unilateral return flow, the coarse dust settling lies in the lower place, in the middle of the furnace, the dust settling lies in the upper part, in the upper part of the furnace walls. With the full return flow, the position of dust settling lies in the meeting point of the two flows, the settling of the coarse dust fraction occurs on irregularity, then that of the fine dust. However, the place the dust settling does not change, but it becomes more regular. In case of a full return flow, only fine dust is carried out of the furnace. The maximum dust on its front of furnace is reduced by direct blowing, the minimum is reduced by a double return flow. There are 3 figures.

ASSOCIATION: "Lenkovskiy institut stali" (Lenkov Steel Institute)

SUBMITTED: July 11, 1958

Card 2, 2

SVN/133-59-6-37/41

AUTHORS: Glinkov, M.A., Doctor of Technical Sciences and  
Glinkov, G.M., Candidate of Technical Sciences

TITLE: Some Thermotechnical Problems of Large Capacity Open  
Hearth Furnaces (Nekotoryye voprosy teplotekhniki  
bol'shegruznykh martenovskikh pechey)

PERIODICAL: Stal', 1959, Nr 6, pp 568-572 (USSR)

ABSTRACT: Possibilities of increasing the productivity of open  
hearth furnaces per unit of their capacity is  
discussed. It is considered that the higher the  
furnace capacity, the higher the quality of the solid  
charge should be. This would permit retaining the  
level of irradiation factor on decreasing of the  
ratio of the surface area of the bath to the furnace  
capacity (S/T). The higher the furnace capacity the  
higher the quality of the liquid iron or semiproduct  
should be as an increase in the thickness of the slag  
layer unavoidably deteriorates conditions of heat  
transfer. Sufficiently advantageous heat exchange  
conditions inside the solid charge and liquid bath can  
be obtained on retaining S/T constant with increasing

Card 1/4

SOV/133-59-6-37/41

Some Thermotechnical Problems of Large Capacity Open Hearth  
Furnaces

furnace capacity. In order to obtain this a different type of steelmaking furnace is necessary - with a working space up to 10 - 12 m wide, hanging roof and two-sided charging (with a corresponding change in the distribution of equipment in the shop). The higher is the laying down property of the flame and its luminosity at the end of the smelting space the lower is non-uniformity in the heat exchange along the length of the furnace. Therefore on increasing the capacity of the furnaces, it is necessary to increase correspondingly the velocity of the fuel stream in order to obtain the required laying down capacity of the flame. In order to improve the flame luminosity at the end of the smelting space, it is necessary to use as a fuel or a carburizing agent, heavy liquid fuels with a large ratio of C/H, on the decomposition of which complex hydrocarbon complexes are formed, securing stable luminosity of the flame.

Card 2/4

50V/133-59-6-37/41

Some Thermotechnical Problems of Large Capacity Open Hearth  
Furnaces

A truly uniform heating of the baths of large furnaces can be obtained with a two-sided supply of fuel into the working space i.e. with simultaneous operation of two dog houses. On transferring an open hearth furnace on firing with oil or a cold gas of a high calorific value this problem can be solved easily by using three-channel dog houses (Fig 5). In each dog house either two side-channels or one central channel operates alternatively. The remaining three channels serve as waste gas flues to pass the waste gas to the regenerators - simultaneously through both dog houses. The movement of the gas in the working space will be mixed (counter-current and recirculation). As each dog house supplies through tuyeres the same amount of fuel, the heating conditions of both halves of the working space should be the same. All four regenerators are preheating air, the reversing system will be little changed. The separation of slag in slag pockets will be facilitated as due to the peculiar

Card 3/4

NOV/133-59-6-37/41

Some Thermotechnical Problems of Large Capacity Open Hearth  
Furnaces

feature of the gas movement in the working space  
the carry over of the slag decreases. There are  
5 figures and 9 Soviet references.

Card 4/4

GLINKOV, M.A., prof., dokt.tekhn.nauk

Readers' response to A.D.Kliuchnikov's article "Method for  
a comparative evaluation of open-hearth furnace parts." Izv.  
vys.ucheb.zav.; chern.met. 2 no.8:179-181 kg '59.  
(MIRA 13:4)

1. Moskovskiy institut stali.  
(Open-hearth furnaces) (Kliuchnikov, A.D.)

**Moscow. Intellectuals**

# PHASE I BOOK EXPLORATION

507/2732

Proizvodstvo i obrabotka stali: spivay (Production and Treatment of Steel and Alloys) Moscow, Metallurgizdat, 1960. 302 p. (Series: Itai, Sbornik, 39) 2100 copies printed.

[illegible]

**REFRAC:** This book is intended for students of physics and engineering who are interested in the properties of light. It is written in a clear and concise manner, and includes many examples and problems. The book is divided into two parts: the first part deals with the properties of light, and the second part deals with the applications of light. The book is a good reference for students and a good textbook for teachers.

Also be asked by students appearing in the exam.

[illegible]

Card 2/10

**Medical Research Service**, **Factor of Technical Services** (Department of  
Electromechanical Use of Oxygen and Complex Technologies for  
Identification of the Electric Power Machine Process of con-  
structional steel

Y. Orlov, V. I. Change of Gas Content in the Open-Hearth Bath During the Decarburization and Holding Period

**Glinkov, M. A. V. A. K.** Candidate of Technical Sciences (Department of Metallurgical Machines). Performance of the Heavy Temperature Ceramic Refrigerator

Markov, B.L., Candidate of Technical Sciences (Department of Metallurgical Processes). Mikhovskaya, A.I. 1956. The Mechanism of the Process of an Intense Phase by Transforming the Heat through the Molten Metal.

Rolling, P. I. a Doctor of Technical Sciences, and B. V. Lesovoy, Candidate of Technical Sciences (Department of Rolling). Investigation of Nonuniformity of Refinement in Rolling





8/14/44 10:00 AM 2025  
A. J. J. J.

Practical aspects of the use of the model are discussed.

and 1.0 mole of hydrogen peroxide in a vessel (1) in which the reaction was carried out. The quantity of sooty carbon, the relative quantities of hydrogen and hydrocarbon compounds were determined, and the values of the reaction conditions. The temperatures in the reaction zone were 1,000; 1,100; 1,200; 1,300 and 1,400°C. At 1,000°C the gas in the reactor was not contained oxygen, which proved that oxidation was not at 1,000°C. The CO content in the gas increased with the rise in temperature, and the  $\text{CO}_2$  content dropped, which is due to the  $\text{CO}_2$  reduction reaction with CO formation and with continued increase in quantities of sooty carbon. More  $\text{CO}_2$  and less CO formed when the air feed was increased. The reaction products in the precipitation vessel were a cloud varying in color from yellowish-white to black, and the precipitated flakes, having a strong naphthalene smell were a mixture of soot and hydrocarbon compounds. Benzene, naphthalene, anthracene and other compounds were extracted with petroleum ether, and asphaltenes with benzene. Figure 3 presents the calculation results showing that the content of methane decreases with a rise in temperature, and the hydrogen content increases with an increase in air feed. Thus, the sooty carbon forms in combined oxidation and thermal decomposition of methane due to thermal decomposition of nonoxidized part of methane, with the formation of some

Card 2/5

Thermal decomposition of gas....

S/148/6C/000/007/023/023/KX

A161/A033

flex hydrocarbon molecules as transient compounds. 2) No strong effect of oxidation on the composition of the forming products was stated. A reduction of  $\text{CO}_2$  to  $\text{CO}$  on account of carbon forming during the decomposition was observed, but no effect of this process on the quantity of the forming products was revealed. 3) The dilution of gas with the formed oxidation products results in some shift of the methane decomposition reaction temperature into higher temperature ranges. There are 4 figures and 3 non-Soviet-bloc references; The references to English language publications read as follows: P. V. Wheelera, W. L. Wood, Fuel. 1928, 7, 535; 1930, 9, 567; K. Koboyaschi, K. Jamamoto, Journ. Chem. Ind. Japan, 1935, 38, 550; 1934, 37, 785.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: Nov. 30, 1959

Card 3/5

S/148/62/000/009/025/025  
A101/A030

AUTHORS: Glinkov, M. A., and Tsou Yen Sir

TITLE: An experimental check of calculation methods for heating ingots in soaking pits

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy Chernaya metallurgiya, no. 9, 1960, 191-198

TEXT: The various existing theoretical calculation methods for heating metal in soaking pits are based on different assumptions, and the calculation results are not always the same for the same cases. An experimental investigation has been carried out for a check. A scale model (1:15) of a soaking pit at the "Alovstal" works was built with two top burners. Ingots were heated with thermocouples imitating the real heating process; the gas temperature was also measured with a sucking thermocouple ("otsasyvayushchaya termopara") in several spots in the work space and the mean temperature was calculated. In the ingots, the temperature was measured in the center of three portions with equal mass, and on the faces, and the mean was calculated. The obtained curves were compared with the curves obtained by

Card 1/2

An experimental check of calculation

S/148/50/000/009/025/025  
A161/A030

calculation per the methods: Fur'ye-Greber, I.D. Semikin, G.P. Ivantsov; the method suggested by N.Yu. Tayts, D.V. Budrin, and V.N. Sokolov. <sup>Abstracter's</sup> note: Details of the listed calculation methods are not given. The conclusions are the following: 1) The calculation method by Fur'ye-Greber based on the assumption of constant heat release and heat conduction coefficients gave a distorted picture; splitting of the heating process into intervals does not ensure sufficient accuracy. 2) The graphical method of I.P. Ivantsov, used with a high number of stages gives results more or less near the real. 3) Determination of total soaking time by D.V. Budrin's method is near the real. 4) The calculation method as suggested by V.N. Sokolov (Ref. 8: Raschet nagreva metallu (Metal Heating Calculations) Mashgin, 1955) gives the best results, provided the temperature of the soaking pit changes little. This method is recommended for practical use. There are 4 figures and 8 Soviet blot references.

ASSOCIATION: Kharkovskiy institut stali (Kharkov Steel Institute)

SUBMITTED 17 April 1960

Card 2/1

GLINKOV, M.A., doktor tekhn.nauk; MEN'SHIKOV, R.I., kand.tekhn.nauk;  
KAGANOV, V.Yu., kand.tekhn.nauk; SOLOMENTSEV, S.I., inzh.

Automatic control of thermal and technological conditions in  
open-hearth furnace smelting. Bull. TSICPM no 10:23-28 '60.  
(MIRA 15:4)

(Open-hearth furnaces) (Automatic control)

GLINKOV, M.A.; FILIMONOV, Yu.P.; KRIVANDIN, V.A.

Flame emanation during the heating of methane containing gas.

Izv. vys. ucheb. zav.; Chern. met. no. 11:149-155 '60.

(MIRA 13:12)

1. Moskovskiy institut stali.

(Methane--Combustion)

S 138/40,000 012 015 010  
138/41/1

AUTHOR: Glazov, M. A.

TITLE: The problem of the open-hearth furnace productivity indices  
(A short discussion)

PERIODICAL: *Inzheneriya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya*,  
no. 12, 1960, 135 - 138

TEXT: The old practice of rating the output of open-hearth furnaces by the specific productivity (ton/m<sup>2</sup> per day) has become obsolete in view of the fact that in relatively small furnaces below 100-ton capacity the ratio ton/m<sup>2</sup> to hearth area varied little, from 1.4 to 1.65, but in the medium 100 - 200-ton furnaces it reaches 5.0 - 5.5. Besides this, the iron time is different at different plants and individual furnaces, and the specific productivity figures are lower for larger furnaces in view of the known fact that the heat exchange conditions are unfavorable. The author discusses several suggestions that have been made by other authors up to now, and refers in particular to the "ton/ton of charge per year" index suggested by D. A. Smolyarskiy, N. I. Yefanov et al. (Ref. 1: *Stal*, 1959, no. 7, 604).

Copyright



S 0113/60/000 011/011.020  
A 111 A 111

The problem of the open-hearth furnace.

(2) which is more appropriate for the present state of the open-hearth furnace. In their investigations the authors utilized an analysis of the production of charge per hour (RPP) of M. A. Hinkov, G. M. Blizhkov, Stal', 1962, No. 1, 166 - 172). The article includes a table illustrating the production of eight furnaces at four Soviet plants - Magnitogorsk Metallurgical Combine (MMK) (Magnitogorsk Metallurgical Combine); Kuznetskiy metallurgicheskiy kombinat (KMK) (Kuznetskiy Metallurgical Combine); Nizhne-Tagil'skiy metallurgicheskiy kombinat (NMMK) (Nizhne-Tagil Metallurgical Combine); Alchevskiy metallurgicheskiy zavod (AMZ) (Alchevsk Metallurgical Plant). The discussed suggestions include foreign practice (production in calendar time), and a system of "production factors" taking into account the peculiarities of individual furnaces. The author is of the opinion that the taking into account of such coefficients would lead to absolute and complete confusion in rating the furnace productivity, but two others he accepts as being of importance, viz. the oxygen effect and, in some cases, the metal grade being smelted. The author concludes: "1) Production in time unit per ton capacity is a more indicative value under certain conditions than production per square meter hearth area

Cont. 1/2

5/14/86/000/012/015/020  
A101/A133

The problem of the open-hearth furnace...

2) An index showing the heat work must be accepted, i.e. "kg/t-hr", or "ton/ton a day". 3) Comparison per calendar time is wrong for the heat work of a furnace since the shop conditions are not comparable. The conditions can be accounted for with the "extensivity factor". 4) The effect of the furnace heat work on the "extensivity factor" (the effect of the furnace life) exists, but it appears to be less marked than the effect of the maintenance organization and other factors that are in the same line, and may be disregarded. 5) Furnaces working with oxygen or with other methods must be compared in separate groups. There is 1 table and 4 Soviet table references.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: August 18, 1952

| Емкость печи, т  | 200   | 200   | 250   | 250   | 400   | 400   | 400    | 500   |
|------------------|-------|-------|-------|-------|-------|-------|--------|-------|
| Завод и печь     | ММК-А | КМК-Б | ММК-В | ММК-Г | КМК-Д | КМК-Е | ИТМК-Ж | АМЗ-З |
| Площадь пода, м² | 65,7  | 71,4  | 73,8  | 73,4  | 75,4  | 71,4  | 81,4   | 96,7  |

Card 3/5

GLINKOV, M.A., doktor tekhn.nauk

Thermotechnical problems in automatic control of furnaces. Mekh.i  
avtom.proizv. 14 no.5:15-18 My '60. (MIRA 14:2)  
(Furnaces) (Automatic control)

AKSEL'ROD, L.G.; GLINKOV, M.A.; GILGOJEN, V.M.; LIPSHITS, A.Y.; MATSEV, L.M.

Prospects for improvements in the design of heating and heat-treating  
furnaces. Stal' 20 no.6:562-567 Jo '66. (IZM 14:2)  
(Furnaces, Heating) (Furnaces, Heat-treating)

GLINKOV, M.A., doktor tekhn.nauk, prof.

Fifty years of existence of the Scientific Technological Society  
of Ferrous Metallurgy. Stal' 20 no.11:961-962 N '60.  
(MIRA13:10)

1. Chlen TSentral'nogo pravleniya nauchno-tekhnicheskogo obsh-  
chestva chernoy metallurgii.  
(Iron--Metallurgy)

GLINKOV, M.A., prof., doktor tekhn.nauk, red.; KONDAKOV, V.V., prof., doktor tekhn.nauk, red.; KUDRIN, V.A., dotsent, kand.tekhn.nauk, red.; OYKS, G.N., prof., doktor tekhn.nauk, red.; YAVOYSKIY, V.I., prof., doktor tekhn.nauk, red.; BORISO, Ye.A., red.; GROMOV, N.D., red.izd-va; KARASEV, A.I., tekhn.red.

[New developments in the theory and practice of making open-hearth steel] Novye v teorii i praktike proizvodstva nartenovskoi stali. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 439 p.

(MIRA 14:4)

1. Moscow. Institut stali. 2. Moskovskiy institut stali (for Glinkov, Kudrin, Oyks, Yavoyakiy).  
(Open-hearth process)

DIOMIDOVSKIY, Dmitriy Aleksandrovich, prof., doktor tekhn.nauk; GLINKOV, M.A., prof., doktor tekhn.nauk, retsentsent; MIKHAYLENKO, A.Ya., red.; ARKHANGEL'SKAYA, M.S., red.izd-va; DOBUZHINSKAYA, L.V., tekhn.red.

[Metallurgical furnaces in nonferrous metallurgy] Metallurgicheskie pechi tsvetnoi metallurgii. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po cherno i tsvetnoi metallurgii, 1961. 728 p.

(MIRA 14:6)

(Metallurgical furnaces)  
(Nonferrous metals--Metallurgy)

S/137/61/COO/011/011/123  
AC60/A101

AUTHOR: Glinkov, M.A.

TITLE:

Thermotechnical problems in the automatic regulation of furnaces

PERIODICAL:

Referativnyy zhurnal. Metallurgiya, no. 11, 1961, 14, abstract  
11B84 (V sb. "Novoye v teorii i praktike proiz-va martenovsk. stali".  
Moscow, Metallurgizdat, 1961, 202-209, Discussion, 332-334)

TEXT:

A distinctive peculiarity of furnaces is the interaction between the thermotechnical and the technological processes. An improvement in the automatic regulation of furnaces has a huge effect, since furnaces hold the first place in power consumption, and the coefficient of useful heat utilization in furnaces is comparatively low, being  $\leq 0.25$  on the average. The main difficulty in making an improved system of automatic regulation of the thermal operation of the furnaces is the close interdependence of the thermotechnical and the technological processes. The course of the technological processes in heat-exchanger furnaces is related in a well-defined fashion with the dynamics of heat assimilation. The heat assimilation is the parameter which as-if connects the domain of technology with that of thermotechnics. A basic dynamic equation is derived for describing

Card 1/ 3



Thermotechnical problems ...

S/137/61/000/011/011/123  
A060/A101

the thermal operation of a furnace:  $Q_{TL}(\tau) = \frac{1}{\eta_{UT}(\tau)} [\Delta \dot{i}(\tau) \cdot D(\tau) + Q_{esc}^M(\tau) - Q_M(\tau)]$  where  $Q_{TL}$  is the thermal load of the fuel combustion, in kilocalories per hour;  $\eta_{UT}$  is the coefficient of useful heat utilization of the furnace;  $D$  is the furnace productivity in kg/hr,  $\Delta \dot{i}$  is the function characterizing the technologically required heat expenditure for the material undergoing the heat-treatment, taking account of the thermal effect of any reactions in the material, in kilocalories/kg;  $Q_{esc}^M(\tau)$  is the function characterizing the chemical and physical heat of the escape products from the combustion of gaseous products of the technological processes, in kilocalories per hour;  $Q_M(\tau)$  is the function characterizing the behavior of the heat on account of the chemical and the physical heats of the gaseous products on the technological processes, in kilocalories/hour. Three principal methods of solving problems of the automatic regulation of the thermal operation of furnaces are considered: the analytic, the semi-empirical, and the empirical. It is noted that the design of systems for automatic regulation of furnaces is most often based upon the physical approach to the thermotechnical problems of regulation. It is proposed that special attention

Card 3/3

Thermotechnical problems ...

S/137/51/000/011/011/123  
A60/A101

re paid to the elaboration of the analytic theory of the thermal operation of  
various furnaces as a basis for developing the scientific foundation of furnace  
regulation.

I. Bolgar

[Abstract in English - Complete translation]

Card 3/3

GLINKOV, M.A.; PORTNOV, A.A.

Flame testing of chambers with a vortex flow of gases and a water-cooled receiver in the center near the surface of the brickwork. Izv. vys.ucheb.zav.; chern.met. 4 no.5:184-188 '61. (MIFA 14:6)

1. Moskovskiy institut stali.  
(Metallurgical furnaces---Testing)

GLINKOV, M.A.; STEPANOV, Ye.M.

Thermal ionization in flame and combustion intensification by  
the field of force. Izv.vys.ucheb.zav.; chern.met. 4 no.9:143-  
152 '61. (MIRA 14:10)

(Ionization) (Combustion)

GLINOV, N.A.; 1961

Abstract of the report of the Commission on the Aerodynamics and  
the use of the results of the aerodynamic tests. (Av. vyzn. i  
zv.; Chern. i. 1961-1962). (NTL 1412)

1. Lomkovski, N.A. 1961. (Av. vyzn. i zv.; Chern. i. 1961-1962). (NTL 1412)

GLINKOV, M.A.; REKHTMAN, A. Ya.

Effect of aerodynamics on dust deposition in slag basins and vertical flues. Izv.vys.ucheb. zav.; chern. met. no.3:161-171 '61.

(MIRA 14:3)

1. Moskovskiy institut stali.

(Metallurgical furnaces--Aerodynamics)

S/148/61/000/003/014/015  
 AR61/AR61

AUTHORS: Glinko, M. A., Forster, A. A.

TITLE: The gas mechanics of sectional furnaces for rapid steel heating

PERIODICAL: Izvestiya vysshikh shkol' zhivotov. Chernova metallurgiya no. 3,  
 1961, 172 - 183

TEXT: A detailed description is presented of tests with rapid-heating cyclone type sectional furnaces and those with burners directing hot gas directly on the face of square billets. The flow was studied in furnace models with the aid of water and dye, and with air. Various chamber diameters and different outlet duct dimensions were tested. The test billets were of round and square shape. The article includes diagrams showing the flow space measured in different spots of the chambers and calculations. The diagrams include a schematic view of the flow in a chamber with burners directed at the center of billet faces. Conclusions: The cyclone motion ensures a separate ignition and intense burning of gas-air mixture, and the gas-air mixture is heated to the highest degree a high temperature in the lining and high heat in the burner space, which in combination results in an intense heat transfer to the workpiece. (Glasnost, 1961)

Card 1/2

The gas velocity in the chamber with large diameter may be reduced to a minimum by increasing the diameter of the inlet duct, which lowers the flow speed at the inlet and creates the zone of laminar flow. It is not possible to obtain a completely even heating of square billets over the entire surface in a cyclone chamber of this type, and even from the faces into the center of billet by heat transfer from the gas faster than heat from the flow. The highest heat supply to surface in the zone of laminar heat transfer from surface to the billet body is achieved when the gas jets are directed to the center of the billet faces, and this arrangement provides more even heating over the entire surface. In cyclone chambers of small diameter the laminar zone at the inlet is absent, the gas speed at the inlet, surface is high, and the heat transfer by convection is more intense. The most favorable chamber type is of small diameter and with partition walls. These are figures and 4. See also references.

ASSOCIATION: Moskovskiy gos. univ. (Moscow State University)

SUBMITTED: June 21, 1970

Card 2/2



00562  
S/148/61/000/009/011/012  
E111/E135

11.7200

AUTHORS: Glinkov, M A., and Stepanov, Ya M.

TITLE: Thermal ionization in a flame and intensification of combustion by applying an electric field

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,  
Chernaya metallurgiya, no.9, 1961 143-152.

TEXT: Stable combustion, with branching of chains, begins after the production of a definite concentration of free radicals and ionized particles. The initial energy impulse (whose magnitude depends on the energy barrier of the fuel molecules) leads to ionization and free-radical formation and the branching-chain combustion reaction. In the present work the authors report and discuss their experiments on combustion from the ionization aspect. The main part of the experiments was on pre-mixed air/gas mixtures with an excess-air coefficient of unity, [Abstractor's note: I think this means with the stoichiometric proportion of air for complete combustion.] with gas flows of 0.24, 0.52 and 0.72 nm<sup>3</sup>/hour and a burner bore of 15 mm. At all the gas flows the ratio of visible-flame length to length of inner  
Card 1/4

30882

S/148/61/000/009/011/012

E111/E135

Thermal ionization in a flame ...

cone was equal to 2.2. To prevent detachment of the flame a little gas was added through an annular gap near the burner mouth. The ionization characteristics were measured every 10 mm along the flame, at 5-6 radial points at each level. Measurements were also made when the gas/air mixture had not been pre-mixed additional investigation then being made of the effect of preheating of the gas (to 200, 400, 600 and 750 °C) on ionization and temperature in the flame. Ionization was found by measuring flame conductivity using two 2-mm diameter diametrically opposed stainless-steel probes insulated in quartz tubes. The amplified current was measured with a micro-ammeter. The ionic concentration was not calculated. Temperature was measured with a platinum-platinum-rhodium thermocouple. The ionization maxima were found to be close to the temperature maxima. From the observed changes of ionization and temperature up the flame it is concluded that in the initial part of the flame rapid ionization is produced due to rapid temperature rise here there are considerably more ionized than reacting molecules. After reaching a maximum, ionization falls rapidly, while temperature continues to rise until heat

Card 2/4

50882

S/148/61/000/009/011/012  
E111/E135

the flame ...

... to the surroundings leads to a slow fall. In this region ... the ... only for maintaining temperature; the ... by the arrival of fresh fuel molecules. ... ionization plots show hysteresis loops whose ... the amount of heat released in the combustion of a ... of fuel ions. Since the calorific value of the gas ... constant, the ratio of gas flows shows the relative ... at different flows: the ratios agree ... with the ratio of the corresponding hysteresis-loop ... but with preheating the ionization ... gradually with fuel flow  $V$  according to

$\max \dots$

... is the initial ionization of molecules, depending on ... temperature or other form of ionizing energy, and also on ... depends on the fuel (0.31 and 0.58 for the fuel used ... and over 700 °C, respectively). Combustion ... by moving the ionization maximum towards the ... at the flame by applying any form of energy at the root. This is observed in experiments in which the heating rates of

30682

S/148/61/000/009/011/012

E111/E135

1. *Chrysomelids* (Coleoptera: Chrysomelidae) are the most common group of beetles found on plants. They are often found on leaves and stems, and some species are known to feed on plants. Examples include the Colorado potato beetle and the flea beetle.

in the experiments with the same heating area were determined at different distances from the flame with and without the application of an electric field. As the authors note, "no information on the effect of the electric field on its application is given". Although the electric field is applied by the field, the effect is not uniform, and the temperature is not uniform. The effect of the electric field is to increase the heating fuel flow. Heat transfer from the flame to the flow meter was also increased (by a maximum of 20-25%). The rate of a lean bath was increased 20-25% by the electric field. The flow in this experiment was not uniform. The electric field is not to be regarded as an effective means of concentrating the heat of the flame.

2. *Author's address:* Department of Metallurgy, Moscow Steel Institute, Moscow, U.S.S.R.

GLINKOV, M.A., doktor tekhn.nauk, prof.; DEMIN, G.I., kand.tekhn.nauk, dotsent

Operation of recirculating-type recuperative steel smelting furnaces.  
Stal' 21 no. 4:317-318 Ap '61. (MIRA 14:4)

1. Moskovskiy institut stali.  
(Smelting furnaces)

GLINKOV, M.A., doktor tekhn.nauk,prof.; GLINKOV, G.M., kand.tekhn.nauk

Response to A. D. Kliuchnikov's remarks. Stal' 21 no.6:566 Je '61.  
(MIRA 14:5)

(Open-hearth furnaces--Design and construction)

GLINKOV, M.A.; GLINKOV, G.M.

Role of heat generation in open-hearth furnace baths.  
Stal' no. 8:751-753 Ag '61. (MIR 14:9)  
(Open-hearth furnaces)

GLINCOV, M.A.; RABINOVICH, A.Ya.; NEVSECHENKO, I.N.

Gas flow and pressure distribution in multichamber holding  
furnace. Vol. 22 no 1-2 84 Jan '82

1. Academy of Sciences Institute  
Leningrad, Russia.



3/10/62/000/006/071/232  
2295/2308

AUTHORS: Glinkov, M.A., Nen'shikov, R.I., Kaganov, V.Yu., and  
Solomentsev, S.L.

TITLE: Development of a complex automatic system for controlling the thermal and technological operating conditions of fusion in open-hearth furnaces using computer equipment

PERIODICAL: Referativnyy zhurnal. Avtomatika i telemektronika, no. 6, 1962, abstract 6-2-200 u (V sb. Primeneniye vychisl. tekhn. dlya avtomatiz. proizvodstva, M., Mashgiz, 1961, 225-237)

TEXT: Work carried out at the Department of Metal Furnaces of the Moskovskiy institut stali (Moscow Steel Institute) in 1957-58 has shown the possibility of designing a closed-loop controller of the thermal operating conditions of an open-hearth furnace, where technological and organization factors are taken into account. The block diagram of a computer-type automatic control system has been developed in which the controlled parameter is the heat absorbed by

Card 1/3

Development of a complex automatic ...

3/14/62/000/003/071/232  
0205/0408

the bath. In practice the heat absorbed by the bath is determined by the computer from the behavior of fusion by proceeding from the difference between the heat input (the combustion of carbon being allowed for) and the quantity of heat carried away by the products of combustion and expended for thermal losses. In the program unit heat absorption is assigned according to the behavior of each period of fusion. The set value of heat absorption for a given instant of fusion is worked out by the program unit according to the quantity of heat that must be transmitted to the bath up to the end of the period, according to loading schedule, carbon-combustion rate and other factors. The difference between the actual and the set value of heat absorption determines the heat load assigned to the regulator. The regulating system is of the closed-loop type with respect to the basic parameter-heat absorption. The rate of liberation of carbon oxides from the bath, the volume of the combustion products and the in-flow and out-flow of air from the working space are determined according to the consumption of fuel, air consumption, total composition of the combustion products and by the result of measurement of their quantity in the general blue. Data obtained in the computer unit on heat absorption and carbon combustion-  
Card 2/3

Development of a complex automatic ...

1/11/52/5661 5/571/244  
7155/5458

tion, can be used for controlling flame reversing and for regulating the pressure in the working space. Since several quantities depending on the process conditions are introduced in the computer unit, intermediate and final calculations are checked periodically in the circuit by means of spot measurements of the corresponding parameters. The computer scheme requires a large number of measurements some of which are difficult to carry out under conditions of open-hearth furnace production. Therefore a simplified procedure was developed in 1958-59 for determining the heat absorbed by the bath and the rate of combustion of carbon. 6 figures. [Abstracter's note: Complete translation.]

Card 3/3

GLINKOV, Mark Alekseyevich; VAGIN, A.A., red. izd-va; SUSHKIN, I.N.,  
red. izd-va; MIKHAYLOVA, V.V., tekhn. red.

[Principles of the general theory of furnaces] Osnovy obshchei  
teorii pechei. Izd. 2., ispr. i dop. Moskva, Metallurgizdat,  
1962. 575 p. (MIRA 15:9)  
(Metallurgical furnaces-- Design and construction)

GLINKOV, M.A.; PROSYANOV, Yu.F.

Effect of the properties of liquid fuel on the luminosity of  
open-hearth furnace flames. Izv. vys. ucheb. zav.; Chern. met.  
5 no.5:170-180 '62. (MIRA 15:6)

1. Moskovskiy institut stali i izhorskoy zavod.  
(Liquid fuels)  
(Open-hearth furnaces—Combustion)

GLINKOV, M.A.; SEROKHVOSTOV, A.L.

Mechanics of gases in the hearth of a uniflow and recirculating  
type steel smelting furnace. Izv. vys. ucheb. zav.; Chern. met.  
5 no.7:188-195 '62. (MIRA 15:8)

1. Moskovskiy institut stali i splavov.  
(Smelting furnaces) (Gas flow)

GLINKOV, M.A.; D'YACHKOV, B.G.

Connection between ionization and heat emission during the burning  
by torch of methane-bearing gas. Izv.vys.ucheb.zav.; Chernomet.  
5 no.11:181-187 '62. (MIRA 15:12)

1. Moskovskiy institut stali i splavov.  
(Gas torches) (Ionization of gases)

GLINKOV, M.A., prof., doktor tekhn.nauk; PROSYANOV, Yu.F., inzh.

Effect of liquid fuel properties and the design of atomizers  
on heat processes in open-hearth furnaces. Stal' 22 no.7:653-658  
Jl '62. (MIRA 15:7)

1. Moskovskiy institut stali i Izhorskiy zavod.  
(Open-hearth furnaces--Design and construction)



GLINKOV, M.A. prof., doktor tekhn.nauk; MITKALINYY, V.I., dotsent, kand.  
tekhn.nauk; KHE YU-TSZIN' [Ho Yu-chin]

Characteristics of aerodynamics in 600 and 900-ton open-hearth  
furnaces with single-channel ports. Stal' 22 no.11:1051-1055  
N '62. (MIRA 15:11)

1. Moskovskiy institut stali.  
(Open-hearth furnaces--Aerodynamics)

BUDRIN, Dmitriy Vasil'yevich; GLINKOV, Mark Alekseyevich, prof.,  
doktor tekhn. nauk; KUZ'MIN, Mikhail Aleksandrovich;  
PLUTNIKOV, Milyay Alekseyevich; SE'IKIN, Iosif Danilovich;  
TROYS, Samuil Grigor'yevich; SAL'NIKOV, A.P., red. izd-va;  
ISLENT'YEVA, P.G., tekhn. red.

[Metallurgical furnaces] Metallurgicheskie pechi. [By] B.V.  
Budrin i dr. Moskva, Metallurgizdat. Pt. 1. [Fuel, refractories,  
principles of heat engineering processes] Toplivo, ogneupory,  
osnovy pechnoi teplotekhniki. 1963. 436 p. (MIRA 16:10)  
(Metallurgical furnaces)

GLINKOV, M.A.; D'YACHKOV, B.G.

Comparison of certain burner arrangements by their ionizing characteristics. Izv.vys.ucheb.zav.; Chern.mel. 6 no.1:179-184 '63. (MIRA 16:2)

1. Moskovskiy institut stal' splavov.  
(Gas burners) (Ionization of gases)

GLENKOV, M.A.; SEROKHOVOSTOV, A.L.

Mixing of flows in blast furnace hearths with uniflow and  
recirculation. Izv. vys. ucheb. zav.; Chern. met. 6 no.3:  
203-208 '63. (MIRA 16:5)

1. Moskovskiy institut stali i splavov.  
(Blast furnaces—Combustion) (Gas flow)

GLINKOV, M.A.

Results of the inter-university conference on methods of calculating  
metallurgical furnace efficiency. Izv. v/s. uchob. zav.; chern. met.  
6 no.5:135-187 '63. (MIRA 16:7)

1. Moskovskiy institut stali i splavov.  
(Metallurgical furnaces) (Heat--Transmission)

GLINKOV, K.A.

Ways of developing methods of calculating furnace efficiency.

Izv. vuz. mekh. sav.; chem. met. G no.9 189-193 '63.

(MIRA 16:11)

1. "Khim. mash. inst." et. 1. 1963, no. 9.

GLINKOV, M.A.; STUL'PIN, Ye.A.

Heat generation in steel melting furnaces. Izv. vys. ucheb. zav.; Chern. met. o. 111 223-229 '63. (MIRA 17:3)

1. Moskovskiy institut stali i spets.

GLINKOV, M.A., prof., doktor tekhn.nauk

Interuniversity conference on methods of calculating the efficiency  
of metallurgical furnaces. Stal' 23 no.3:286-287 Mr '63.  
(MIRA 16:5)

1. Moskovskiy institut stali i splavov.  
(Metallurgical furnaces)



MITCALINSKY, Vsevolod Lvovich; AKASHKIN, Leonid Lvovich;  
TASHCHENKO, Aleksandr Ivanovich; and GILIN, Boris Lvovich;  
GLINKIN, Nikolai Lvovich. *Metallurgicheskie pechi.*

[Metallurgical furnaces; an atlas] *Metallurgicheskie pechi:*  
atlas. Izd. 2., pererab. i dopoln. [Leningrad, 1964]. 319 p.  
Plans for the atlas "Metallurgicheskie pechi" [Leningrad,  
"Metallurgicheskie pechi." 1964]. (1964)

GLINKOV, M.A.; KAGANOV, V.Yu.; BLINOV, O.M.

Obtaining information necessary for the optimum control of  
thermal conditions in furnaces. Izv. vys. ucheb. zav.; chern.  
met. 7 no.1:162-165 '64. (MIRA 17:2)

1. Moskovskiy institut stali i splavov.

GLINKOV, M.A.; STUL'PIN, Ye.A.

Oxidizing properties of 500-ton open-hearth furnaces during  
the smelting period. Izv. vys. ucheb. zav.; Chern. met. 7  
no.1:174-177 '64. (MIRA 17:2)

1. Moskovskiy institut stali i splavov.

